




UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,299	03/31/2004	Jonathan R. Hughes	124-1074	4545
23117	7590	11/19/2004	EXAMINER DINH, JACK	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			ART UNIT 2873	PAPER NUMBER

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	<p>Application No.</p> <p>10/813,299</p>	<p>Applicant(s)</p> <p>HUGHES ET AL.</p>	
	<p>Examiner</p> <p>Jack Dinh</p>	<p>Art Unit</p> <p>2873</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0304</u> . | 6) <input checked="" type="checkbox"/> Other: <u>DETAILED ACITON</u> . |

DETAILED ACTION

Drawings

1. The hand-drawn drawings are objected to. New formal drawings are required. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

2. The specification is objected to because of the following informalities. The title for subsections are missing. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 6, the phrase "a layer of nematic liquid crystal material arranged to give a layer of retardation optimized to give maximum diffraction efficiency between switched and unswitched states" renders the claim indefinite. It is unclear of the configuration required to give

Art Unit: 2873

a layer of retardation optimized to give maximum diffraction efficiency between switched and unswitched states.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 2-5, 13 and 14 are rejected under 35 U.S.C. 102(e) as being unpatentable by Payne et al. (US Patent 6,753,990).

Regarding claim 2, Payne (figure 1) is interpreted as disclosing a spatial light modulator imaging system comprising an EASLM 1, a monostable OASLM 8 arranged to receive addressing light 2 from the EASLM through an optical system 5, a controller for loading images

Art Unit: 2873

onto the EASLM then optically onto the OASLM, and for applying write voltages to the OASLM simultaneously with application of addressing light, a read light for illuminating the OASLM to provide visible images, the arrangement being such that a plurality of images are read into the EASLM and thence onto the OASLM at a rate sufficient to present a stable image to an observer (col. 3, line 14 – col. 4, line15).

Regarding claims 3 and 4, Payne is interpreted as further disclosing that the read light is coherent or incoherent (col. 4, lines 54-60).

Regarding claim 5, Payne is interpreted as further disclosing that the OASLM comprises a layer of a nematic liquid crystal material (col. 4, lines 15).

Regarding claim 13, Payne is interpreted as disclosing that the controller contains computer generated holographic images for providing a diffraction pattern to be loaded into the EASLM and displayed to an observer as a three dimensional image (col. 3, lines 14-22).

Regarding claim 14, Payne is interpreted as disclosing that the EASLM is an m by n array of separealy addressable EASLMs and the OASLM is an m by n array of segments (col. 3, lines 23-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al. (US Patent 6,753,990).

Regarding claim 1, Payne is interpreted as disclosing a spatial light modulator imaging system comprising an EASLM 1, an OASLM 8 comprising a layer of nematic liquid crystal material contained between two parallel cell walls, an optical system 5 for directing light from the EASLM onto the OASLM, a controller for loading images onto the EASLM then optically onto the OASLM, and for applying write voltages to the OASLM simultaneously with application of addressing light, a read light source providing coherent light for illuminating the OASLM to provide visible diffracted images, the arrangement being such that a plurality of images are read into the EASLM and thence onto the OASLM at a rate sufficient to present a stable image to an observer (col. 3, line 14 – col. 4, line15). Payne is interpreted as disclosing all the claimed limitations except that the parallel cell walls are in opposite direction alignment, and that the layer thickness d and the birefringence Δn at a wavelength λ approximately satisfy the equation $\Delta n \cdot d = \lambda/4$. However, changing the alignment to any direction would be within the knowledge of one skilled in the art. In addition, with the constant birefringence Δn of the material, any thickness d can be experimented at a particular wavelength λ . It is considered not inventive to discover the optimum range through routine experimentation. Therefore, it would

Art Unit: 2873

have been obvious to one of ordinary skill in the art at the time the invention was made to provide a thickness satisfy the equation $\Delta n \cdot d = \lambda/4$ for the purpose of selecting a preferred thickness.

6. Claims 6-9 and 15, are rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al. (US Patent 6,753,990), as applied in claim 2.

Regarding claims 6 and 9, Payne is interpreted as disclosing all the claimed limitations, as described above, except that the nematic liquid crystal material are arranged between two cell walls provided with parallel in opposite direction alignment, and that the layer thickness d and the birefringence Δn at a wavelength λ approximately satisfy the equation $\Delta n \cdot d = \lambda/4$, to give maximum diffraction efficiency between switched and unswitched states. However, changing the alignment to any direction would be within the knowledge of one skilled in the art. In addition, with the constant birefringence Δn of the material, any thickness d can be experimented at a particular wavelength λ . It is considered not inventive to discover the optimum range through routine experimentation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a thickness satisfy the equation $\Delta n \cdot d = \lambda/4$ for the purpose of selecting a preferred thickness for optimizing diffraction efficiency.

Regarding claims 7, 8 and 15, Payne is interpreted as disclosing all the claimed limitations, as described above, except that the two cell walls are in opposite direction alignment with a surface tilt of less than 10 degrees, or arranged in a twisted configuration. However,

Art Unit: 2873

changing the alignment to any direction or tilting the surface or arranging in a twisted configuration would be well within the knowledge of one skilled in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the cell walls in opposite direction alignment with a surface tilt, for the purpose of selecting a preferred configuration for the OASLM.

6. Claim 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al. (US Patent 6,753,990), as applied in claim 2, in view of the Applicant's acknowledged prior art (specification).

Regarding claims 10-12, Payne is interpreted as disclosing all the claimed limitations, as described above, except that the EASLM is a single EASLM whose output is arranged to be scanned sequentially over different segments of the single OASLM, or an OASLM formed by a plurality of single OASLMs. Within the same field of endeavor, the Applicant's acknowledged prior art discloses a single EASLM whose output is arranged to be scanned sequentially over different segments of the OASLM (specification, page 2, lines 1-4). In addition, since the information is scanned sequentially, it would have been obvious to provide an OASLM formed by a plurality of single OASLMs. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select these configurations, for the purpose of selecting a preferred arrangement and method of scanning.


Other Information/Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is 571-272-2327. The examiner can normally be reached on M-F (9:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack Dinh


Georgia Epps
Supervisory Patent Examiner
Technology Center 2800